Abbas Askar

Nationality: Pakistani
Date of birth: 31 August 1987
Mailing Address:
Box 43,
SE-221 00 Lund
Sweden

Email:
askar@astro.lu.se
abbas.askar@gmail.com
Webpage:
https://abbasaskar.com/
Phone: +46 722 332 274
ORCID: 0000-0001-9688-3458

Professional Appointments/Positions

- Lund Observatory, Department of Astronomy and Theoretical Physics, Lund University, Lund, Sweden — **12/06/2018 to present**
  Postdoctoral Researcher (Carl Tryggers Fellow)
- Nicolaus Copernicus Astronomical Center, Warsaw, Poland — **04/11/2013 to 25/05/2018**
  Graduate Student/Research Assistant

Education

- **PhD in Astronomy & Astrophysics (with distinction)** — **04/11/2013 to 25/05/2018**

Nicolaus Copernicus Astronomical Center (CAMK)
Polish Academy of Sciences, Warsaw, Poland
Supervisor: Dr. Mirek Giersz
Thesis: *"Investigation of Black Hole Populations in Dense Stellar Systems using MOCCA code for Star Cluster Simulations"*

- **Master of Science in Astronomy & Astrophysics** — **04/10/2010 to 27/09/2012**

AstroMundus-Erasmus Mundus Joint Masters Program in Astrophysics
University of Innsbruck, Austria (1st semester)
University of Padova, Italy (2nd & 4th semesters)
University of Belgrade, Serbia (3rd semester)
Master Thesis: *"Optical Counterparts of Ultraluminous X-ray Sources"*
Supervisor: Dr Luca Zampieri (INAF - Padova)

- **Bachelor of Science (Honors) & Bachelor of Arts (Honors) in Liberal Arts & Sciences** — **21/08/2006 to 10/07/2009**

University College Utrecht, Utrecht University, The Netherlands
Double Major in Physical Sciences (Physics & Mathematics)
& Humanities (Philosophy & Religious Studies)

Bachelor Thesis (Science) : *"Peculiar Features in the Onsets of Thermonuclear Flashes on Neutron Stars"*
Supervisor: Dr. Jean in't Zand (HEA, SRON Netherlands Institute for Space Research)

Bachelor Thesis (Humanities): *"The Problem of Redemptive Truth: From Nietzsche to a Post-Metaphysical Culture"*
Supervisor: Dr. Floris van der Burg (University College Utrecht)

- **GCE Advanced & Ordinary Level** — **03/09/2001 to 30/06/2006**

University College Lahore, Lahore, Pakistan
5 years of the British high school curriculum

Refereed Published/Accepted Publications in Peer-Reviewed Journals

18 peer-reviewed publications that have been published in scientific journals between 1st December, 2015 to 24th December, 2018.

Metrics:
Citations from published peer-reviewed papers (excluding self-citations): 270 (from 180 papers)
H-Index (Including all refereed publications and preprints): 12
Total Citations: 472 (373 excluding Self-Citations)
Citation source: NASA ADS, consulted 24th December 2018

1. D. Belloni, M. Giersz, L.E. Rivera Sandoval, **A. Askar**, P. Ciecieląg: *MOCCA-SURVEY database I. Accreting white dwarf binary systems in globular clusters – IV. cataclysmic variables – properties of bright and faint populations. Monthly Notices of the Royal Astronomical Society*, Volume 483, Issue 1, p.315-331 (2019).
Link: http://adsabs.harvard.edu/abs/2019MNRAS.483..315B

2. J. Morawski, M. Giersz, **A. Askar**, and K. Belczynski: *MOCCA-SURVEY Database I: Assessing GW kick retention fractions for BH-BH mergers in globular clusters. Monthly Notices of the Royal Astronomical Society*, Volume 481, Issue 2, p.2168-2179 (2018).
Citations: 4 Link: http://adsabs.harvard.edu/abs/2018MNRAS.481.2168M

3. J. Hong, E. Vesperini, **A. Askar**, M. Giersz, and M. Szkudlarek: *Binary Black Hole Mergers from Globular Clusters: the Impact of Globular Cluster Properties.. Monthly Notices of the Royal Astronomical Society* Volume 480, Issue 4, p.5645-5656 (2018).
Citations: 3 Link: http://adsabs.harvard.edu/abs/2018MNRAS.480.5645H

4. M. Arca-Sedda, **A. Askar**, and M. Giersz, *MOCCA-SURVEY Database I. Unravelling black hole subsystems in globular clusters. Monthly Notices of the Royal Astronomical Society* Volume 479, Issue 4, p.4652-4664 (2018).
Citations: 15 Link: http://adsabs.harvard.edu/abs/2018MNRAS.479.4652A

5. A. Askar, M. Arca-Sedda, and M. Giersz, *MOCCA-SURVEY Database I: Galactic Globular Clusters Harbouring a Black Hole Subsystem. Monthly Notices of the Royal Astronomical Society* Vol. 478, Issue 2, p.1844-1854 (2018).
Citations: 17 Link: http://adsabs.harvard.edu/abs/2018MNRAS.478.1844A

6. K. Belczynski, **A. Askar**, M. Arca-Sedda, M. Chruslinska, M. Donnari, M. Giersz,M. Benacquista, R. Spurzem, D. Jin, G. Wiktorowicz and D. Belloni: *The The origin of the first neutron star – neutron star merger*. *Astronomy & Astrophysics*, Volume 615, id.A91, 13 pp (2018).
Citations: 22 Link: http://adsabs.harvard.edu/abs/2018A%26A...615A..91

7. A. Askar, M. Giersz, W. Pych, E. Dalessandro: *COCOA code for creating mock observations of star cluster models. Monthly Notices of the Royal Astronomical Society* Vol 475, Issue 3, p.4170-4185 (2017).
Citations: 1 Link: http://adsabs.harvard.edu/abs/2018MNRAS.475.4170A

8. J. Samsing, **A. Askar**, M. Giersz: *MOCCA-SURVEY Database I: Eccentric Black Hole Mergers During Binary-Single Interactions In Globular Clusters. The Astrophysical Journal* Vol. 855, 2, article id. 124, 5 pp.(2018)
Citations: 19 Link: http://adsabs.harvard.edu/abs/2018ApJ...855..124S.

9. J. Hong, R. de Grijs , **A. Askar**, P. Berczik, C. Li, L. Wang, L. Deng, M. B. N. Kouwenhoven, M. Giersz, M., R. Spurzem: *The dynamical origin of multiple populations in intermediate-age clusters in the Magellani clouds. Monthly Notices of the Royal Astronomical Society* Vol 472, 1, p.67-77(2017).
Citations: 9 Link:http://adsabs.harvard.edu/abs/2017MNRAS.472...67H

10. D.Belloni, **A. Askar**, M. Giersz, P. Kroupa & H.J, Rocha-Pinto: *On the initial binary population for star cluster simulations. Monthly Notices of the Royal Astronomical Society* Vol 471, 3, p.2812-2828 (2017).
Citations: 11 Link: http://adsabs.harvard.edu/abs/2017MNRAS.471.2812B

11. D.Belloni, M. Zorotvic, M.Schreiber, N.W.C Leigh, M.Giersz & **A. Askar**: *MOCCA-SURVEY database I. Accreting white dwarf binary systems in globular clusters – III. Cataclysmic variables – Implications of model assumptions. Monthly Notices of the Royal Astronomical Society* 2017 Vol. 468, 2, p.2429-2446 (2017).
Citations: 7 Link: http://adsabs.harvard.edu/abs/2017MNRAS.468.2429B

12. R.d. Vita, M. Trenti, P. Bianchini, **A. Askar**, M. Giersz, G. van de Ven: *Prospects for detection of intermediate-mass black holes in globular clusters using integrated-light spectroscopy. Monthly Notices of the Royal Astronomical Society* Vol. 467, 4, p.4057-4066 (2017).
Citations: 5 Link: http://adsabs.harvard.edu/abs/2017MNRAS.467.4057D

13. D. Belloni, M. Giersz, H.J, Rocha-Pinto, N.W.C Leigh, **A. Askar**: *MOCCA-SURVEY database I. Accreting white dwarf binary systems in globular clusters - II. Cataclysmic variables - progenitors and population at birth. Monthly Notices of the Royal Astronomical Society* Vol 464, 4, p.4077-4095 (2017).
Citations: 4 Link: http://adsabs.harvard.edu/abs/2017MNRAS.464.4077B

14. A. Askar, M. Szkudlarek, D.Gondek-Rosińska, M. Giersz, T. Bulik: *MOCCA-SURVEY Database - I. Coalescing binary black holes originating from globular clusters. Monthly Notices of the Royal Astronomical Society Letters* Vol. 464, p.L36-L40 (2017).
Citations: 73 Link: http://adsabs.harvard.edu/abs/2017MNRAS.464L..36A

15. A. Askar, P. Bianchini, R.d. Vita, M. Giersz, A. Hypki, S. Kamann: *MOCCA-SURVEY Database I: Is NGC 6535 a dark star cluster harbouring an IMBH? Monthly Notices of the Royal Astronomical Society* Vol 464,3, p.3090-3100 (2017).
Citations: 8 Link: http://adsabs.harvard.edu/abs/2017MNRAS.464.3090A

16. D. Belloni, M. Giersz, **A. Askar**, N.W.C Leigh, A.Hypki: *MOCCA-SURVEY database I. Accreting white dwarf binary systems in globular clusters - I. Cataclysmic variables - present-day population. Monthly Notices of the Royal Astronomical Society* Vol. 462, 3, p.2950-2969 (2016).
Citations: 11 Link: http://adsabs.harvard.edu/abs/2016MNRAS.462.2950B

17. L. Wang, R. Spurzem, S. Aarseth, M. Giersz, **A. Askar**, P. Berczik, T. Naab, R. Schadow, M. B. N. Kouwenhoven: *The DRAGON simulations: globular cluster evolution with a million stars .Monthly Notices of the Royal Astronomical Society* Vol. 458, 2, p.1450-1465 (2016).
Citations: 72 Link: http://adsabs.harvard.edu/abs/2016MNRAS.458.1450W

18. M. Giersz, N. Leigh, A. Hypki, N. Lützgendorf, **A. Askar**: *MOCCA code for star cluster simulations - IV. A new scenario for intermediate mass black hole formation in globular clusters. Monthly Notices of the Royal Astronomical Society* Vol. 454, 3, p.3150-3165 (2015).
Citations: 59 Link: http://adsabs.harvard.edu/abs/2015MNRAS.454.3150G

Papers Submitted to Peer-Reviewed Journals

4 papers currently undergoing review (2 are expected to be shortly accepted). Total citations of available preprints: 62

1. J. Samsing, D.J D'Orazio, **A. Askar**, and M. Giersz: *Black Hole Mergers from Globular Clusters Observable by LISA and LIGO: Results from post-Newtonian Binary-Single Scattering Interactions In Globular Clusters* (Submitted to Phys. Rev. D 2018)
Citations: 19 Link: http://adsabs.harvard.edu/abs/2018arXiv180208654S.

2. K. Belczynski, J. Klencki, G. Meynet, C. L Fryer, D. A Brown, M. Chruslinska, W. Gladysz, R. O'Shaughnessy, T. Bulik, E. Berti, D. Holz, D. Gerosa, M. Giersz, S. Ekstrom, C. Georgy, **A. Askar**, J.P Lasota,D. Wysocki: *GW170104 and the origin of heavy, low-spin binary black holes via classical isolated binary evolution* (Submitted to ApJ 2018)
Citations: 43 Link: http://adsabs.harvard.edu/abs/2017arXiv170607053B.

3. M. Pasquato, M. Mapelli, M. Giersz, **A. Askar**: *Detecting IMBHs with machine learning: feature-based supervised classification - I. Detecting IMBHs with machine learning: feature-based supervised classification - I.* (Submitted to MNRAS 2018)

4. A. Askar, **A. Askar**, M. Pasquato, M. Giersz,: *Finding Black Holes with Black Boxes Using Machine Learning to Identify Globular Clusters with Black Hole Subsystems* (Submitted to MNRAS 2018)
Link: http://adsabs.harvard.edu/abs/2018arXiv181106473A

Research Monographs/Chapters

Contributed to Chapter 5 (“Dynamical Formation of Stellar-mass Binary Black Holes") of the White Paper for the COST action "Gravitational Waves, Black Holes, and Fundamental Physics (2018)" as a section coordinator and co-author:

• B. Leor, V. Cardoso, S. Nissanke, T. P Sotiriou, **A. Askar**, K. Belczynski, G. Bertone, E. Bon, D. Blas, R. Brito & 192 coauthors. *Black holes, gravitational waves and fundamental physics: a roadmap*
Citations: 56 Link: http://adsabs.harvard.edu/abs/2018arXiv180605195B.

Published Conference Proceedings

1. M. Szkudlarek, D.Gondek-Rosińska, **A. Askar**, T. Bulik, M. Giersz: *Black Hole Binaries from Globular Clusters as Sources of Gravitational Waves* (52nd Rencontres de Moriond on Gravitation (Moriond Gravitation 2017)
Link: http://inspirehep.net/record/1671193/files/1639583_21-26.pdf

2. M. Giersz, N. Leigh, A. Hypki, **A. Askar**, N. Lützgendorf: *Formation mechanisms of IMBH in globular clusters* (MmSAI v.87, p.555 2016).
Citations: 4 Link: http://adsabs.harvard.edu/abs/2016MmSAI..87..555G

3. D. Belloni, M. Giersz, **A. Askar**, Hypki: *Cataclysmic variables in globular clusters . First results on the analysis of the MOCCA simulations database* (MmSAI v.87, p.551 2016).
Link: http://adsabs.harvard.edu/abs/2016MmSAI..87..555G

4. A. Askar, M. Giersz, W. Pych, A. Olech, A. Hypki: *MOCCA code for star cluster simulation: comparison with optical observations using COCOA* (IAU Symposium, Volume 312, pp. 262-263 2016).
Citations: 5 Link: http://adsabs.harvard.edu/abs/2016IAUS..312..262A

5. M. Giersz, N. Leigh, M. Marks, A. Hypki, **A. Askar**: *Monte Carlo modeling of globular star clusters: many primordial binaries and IMBH formation* (IAU Symposium, Volume 312, pp. 213-222 2016).
Citations: 1 Link: http://adsabs.harvard.edu/abs/2016IAUS..312..213G

Talks & Conferences

• Talk on “How black holes can influence the evolution of globular clusters" at the MWStreams 2018 conference on “Survival of Dense Star Clusters in the Milky Way System" (Heidelberg, Germany 2018)

• Invited Talk on *“Black Hole Populations in Galactic Globular Clusters”* at the SFB 881 International Workshop on Star “Clusters around the Milky Way and in the Local Group" (Heidelberg, Germany 2018)

• Invited to attended meeting of the “Evolution of Rich Stellar Populations & Black Hole Binaries" International Space Science Institute (ISSI) Team as a core participant and presented a talk on *“Black Hole Subsystems in Galactic Globular Clusters”* at the ISSI (Bern, Switzerland 2018).

• Talk on *“Black Hole Subsystems in Galactic Globular Clusters”* at MODEST 18 (Santorini, Greece 2018).

• Invited Seminar Talk on *“Investigating Black Hole Populations in Globular Clusters with MOCCA Code for Star Cluster Simulations”* at Galileo Galilei Department of Physics and Astronomy, University of Padova/INAF-Astronomical Observatory of Padova (Padova, Italy 2018).

• Invited Seminar Talk on *“Investigating Black Hole Populations in Globular Clusters with MOCCA Code for Star Cluster Simulations”* at Eötvös Loránd University (Budapest, Hungary 2018).

• Invited Talk on *“MOCCA-Survey Database I: Binary Black Holes and Intermediate Mass Black Holes in Globular Clusters”* at Numerical Scattering Workshop, Center for Computational Astrophysics, Flatiron Institute, (New York City, USA 2017).

• Talk on *"Gravitational Waves and High Energy Sources Originating From Globular Clusters"* at MODEST 17 (Prague, Czech Republic 2017).

• Invited Seminar Talk on *"MOCCA-Survey Database I: Binary Black Holes and Intermediate Mass Black Holes in Globular Clusters"* at Lund Observatory Seminar (Lund, Sweden 2017).

• Talk on *"MOCCA-Survey Database I: Binary Black Holes and Intermediate Mass Black Holes in Globular Clusters"* at Nicolaus Copernicus Center Wednesday Colloqium (Warsaw, Poland 2017).

• Talk on *"Coalescing Binary Black Holes Originating from Globular Clusters"* at Heraeus-Seminar 61: Stellar Aggregates (Bad Honnef, Germany 2016).

• Invited Seminar Talk on *"MOCCA-Survey Database I: Binary Black Holes and Intermediate Mass Black Holes in Globular Clusters"* at KIAA/Peking University Lunch Talk (Beijing, China 2016).

• Invited Talk on *"Merging Binary Black Holes Originating from Globular Clusters"* at Astro-GR 2016 Meeting (Benasque, Spain 2016).

• Presented poster on *"Simulating Observations of MOCCA Star Cluster Simulations with COCOA"* at EES 2015 School on Stellar Clusters (Banyuls sur Mer,France 2015).

• Talk on *"Simulating Observations of MOCCA Star Cluster Simulations with COCOA"* at MODEST 15 (Concepcion, Chile 2015).

• Poster presentation, *"MOCCA Code for Star Cluster Simulations: Comparison with Optical Observations using COCOA"* at International Conference of Young Astronomers (Toruń, Poland 2014).

• Poster entitled, *"MOCCA Code for Star Cluster Simulations: Comparison with Optical Observations using COCOA"* (presented by M. Giersz) at IAUS 312: Star Clusters & Black Holes in Galaxies across Cosmic Time (Beijing, China 2014).

• Talk on *"X-ray Bursts"* at the 5th Serbian Astronomical Student Workshop hosted by University of Belgrade and University of Novi-Sad (Belgrade, Serbia 2011).

Prizes & Awards

• PhD Scholarship in Stellar Dynamics, National Science Center, Poland (2013 to 2017)
• Award for Best Poster at International Conference of Young Astronomers (Toruń, Poland 2014)
• Erasmus Mundus (European Commission) Scholarship for Joint Masters Degree in Astrophysics and Astronomy (2010 to 2012) Total Award: 15,000 Euros
• Excellence Scholarship for Undergraduate Studies at University College Utrecht (2006-2009)
Total Award: $\sim$ 21,000 Euros
• Merit Scholarship for A Levels at University College Lahore (2004-2006)
• Award for Excellence in Computing, University College Lahore (2005)
• Award for Academic Excellence, Bloomfield Hall School (2001)

Funding & Grants

• Carl Tryggers Fellowship for postdoctoral research awarded by the Carl Tryggers Foundation for Scientific Research (2018 to 2020) Total Funding: 52,500 Euros
• PI of the Preludium grant for PhD students awarded by the Polish National Science Center (2016 to 2018)
Title: *Black Hole Binary Zoo in Globular Clusters* Total Funding: 15,750 Euros
• PI of the Nicolaus Copernicus Astronomical Center Grant for Young Researchers (2015 to 2017)
Title: *Simulating Mock Observations of Star Cluster Simulations* Total Funding: 3000 Euros

Supervising & Mentoring Activities

• Master thesis supervisor of Lucas Hellström (Master student at Lund University 2019-2020)
• Supervised research project of Ammar Askar (Bachelor student at Purdue University 2018)
• Co-supervised summer student projects at Nicolaus Copernicus Astronomical Center:
    • Jakub Morawski (2017 Bachelor Student, Warsaw Observatory)
    • Piotr Kołodziejski (2016 Bachelor Student, Warsaw Observatory)

- Jakub Klencki (2016 Master Student, Warsaw Observatory)
- Piotr Adamczyk (2015 Bachelor Student, Warsaw Observatory)
- Magdalena Szponar (2015 Bachelor Student, Warsaw Observatory)

• Co-supervised and assisted with Masters thesis project of Riko Schadow (Ludwig Maximilian University of Munich, 2015) and research project by Arthur Kuehlwein (Heidelberg University, 2015)

Popular Talks and Public Lectures

• Invited Popular Talk on *"Binary Black Holes and Intermediate Mass Black Holes in Globular Clusters"* at Koło Naukowe Astronomów (Student's Astronomy Circle), University of Warsaw Observatory (Warsaw, Poland 2017).

• Presented popular talks on 'Evolution of Star Clusters' at Spotkanie Mlodych (Young Astronomers Meeting), Nicolaus Copernicus Astronomical Center (2014 and 2016).

Service Work and Meeting Organization

• Peer Reviewer for Monthly Notices of Royal Astronomical Society

• Member of LOC and SOC for ELTs for All meeting at Lund Observatory in Sweden (11 to 12 February, 2019).

• Member of LOC for Spotkanie Mlodych (Young Astronomers Meeting) at Nicolaus Copernicus Astronomical Center (2014 and 2016).

Skills & Miscellaneous

Languages

- Urdu (Native)
- English (Fluent)-TOEFL (Computer Based) Score: 273/300 (February 2006)
- Punjabi (Intermediate Level)
- Dutch (Beginner Level)

Computer Skills

- Scientific programming in Python, Fortran, shell scripting, C
- Wolfram Mathematica and MATLAB

Extracurricular Activities

- Assembled and setup muon detectors at University College Utrecht (Part of HiSparc project)
- Junior Advisor at University College Utrecht (2007-2008)
- Represented University College Lahore in many nationwide quiz competitions (2001 to 2006)
- Member of University College Lahore debating team in All-Pakistan parliamentary style debates at Under 17 & Under 19 Level between 2001 & 2006